The present application was filed on January 18, 2000 with claims 1-21. Claims 1-21 are pending in the application.

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks.

The specification has been amended to correct minor errors of a typographical nature. The amendments address the specification objection raised by the Examiner.

Claims 1, 11 and 21 have been amended to address the claim objections raised by the Examiner.

With regard to the rejection of claims 2, 8, 12, 18 and 21 under 35 U.S.C. §112, second paragraph, these claims have been amended in a manner which is believed to overcome the rejection.

With regard to the rejection of claims 9 and 19 under §112, second paragraph, the Examiner argues that there is no description in the disclosure or claims pertaining to the "remotely-assigned address information in a header" of a particular received packet. Applicants respectfully disagree. The claimed arrangement is believed to be described in the specification. For example, page 4, lines 14-23 of the specification provides as follows, with emphasis supplied:

> The present invention solves this significant problem of the prior art by implementing an address substitution mechanism in an otherwise conventional ATU-R or other gateway device. In accordance with the invention, gateway 110 is configured to intercept and store all address assignments issued by a remote network address server during an IP address assignment process, e.g. during a designated IP address exchange interval. The gateway 110 will then "trap" all incoming requests during, e.g., capabilities identification exchanges, and reissue the requests after evaluating and potentially adjusting the address fields thereof to a format suitable to each of the other devices on the LAN 102. Finally, at transport service time, the gateway 110 will receive individual message requests from devices on the LAN 102, map their addresses to appropriate substitution addresses, and reissue the messages with the altered addresses.

It is well known that IP messages are in packet format, and that the address information associated with a given such message is typically contained in the header of a corresponding packet. Therefore, the specification in conjunction with this common knowledge clearly supports the claim limitations in question. The rejection of claims 9 and 19 under §112, second paragraph, is therefore believed to be improper and should be withdrawn.

With regard to the rejection of claims 10 and 20 under §112, second paragraph, the Examiner argues that the "related services" referred to in these claims are not described in a sufficiently clear manner. Applicants respectfully disagree. The specification at page 8, lines 8-12, provides as follows:

> It should be noted that a gateway of the type described above may be configured to provide a number of other processing operations. For example, a gateway may be configured to intercept control information and/or maintenance information sent over a network for delivery to a particular device, and may perform related control and/or maintenance services on behalf of the particular device.

Thus, it is believed that the specification clearly indicates that an illustrative example of the "related services" as claimed comprises related control and/or maintenance services. The rejection of claims 10 and 20 under §112, second paragraph, is therefore believed to be improper and should be withdrawn.

Independent claims 1, 11 and 21 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,157,950 (hereinafter "Krishnan"). Applicants respectfully traverse the §102(e) rejection.

Applicants initially note that MPEP §2131 specifies that a given claim is anticipated "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, MPEP §2131 indicates that the cited reference must show the "identical invention . . . in as complete detail as is contained in the . . . claim," citing Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed.

Cir. 1989). Applicants submits that the Examiner has failed to establish anticipation of at least independent claims 1, 11 and 21 by the Krishnan reference.

Independent claim 1 is directed to an apparatus for use in interfacing a local network to one or more external network elements. The apparatus includes a gateway coupled between the local network and the one or more external network elements. The gateway is operative to perform the following functions:

(i) to determine remotely-assigned address information for a given device attached to the local network; and

(ii) to establish, based at least in part on the remotely-assigned address information, a substitution address for use by at least one other device attached to the local network when communicating with the given device.

In formulating the §102(e) rejection, the Examiner argues that limitation (i) above is met by the disclosure in column 3, lines 17-28 and column 5, lines 30-34 of Krishnan (Office Action, page 5, first paragraph). These cited portions of Krishnan provide as follows:

The present invention is directed to methods and apparatus for sharing a single Internet Protocol (IP) address with several computers connected to a Local Area Network (LAN) or several peripheral devices connected to a single computer. In either instance, one of the computers on the LAN, or the single computer, is programmed to serve as a gateway computer that interfaces with the Internet. The gateway computer modifies all outgoing data packets to the Internet to appear as if originating from the gateway computer, and provides a destination port for all communications received from the Internet to appear as if destined for the gateway computer.

. . .

The network carriers in turn subdivide their blocks of addresses and assign blocks of addresses to Internet Service Providers (ISP), who in turn subdivide and assign IP addresses to their clients, and so on.

Applicants submit that there is no teaching regarding limitation (i) in the cited portions of Krishnan. More specifically, there is no disclosure regarding the determination in a gateway of remotely-assigned address information for a given device attached to a local network, which the gateway can utilize to establish a substitution address for use by at least one other device attached to the local network when communicating with the given device.

The Examiner further argues that limitation (ii) above is met by the disclosure in column 7, line 59, to column 8, line 9 of Krishnan. The cited portion of Krishnan provides as follows, with emphasis supplied:

Computer 43 first assembles packet 40, which includes the IP address and port number of destination computer 46, e.g., 179.34.71.46:80, as well as its own source IP address and port number, e.g. 1.2.3.43:512. Because there is no direct connection between computer 43 and the Internet, packet 40 is routed on LAN 44 to gateway computer 41.

Routing software on gateway computer 41 records the source IP address and port number, e.g., 1.2.3.43:512, and substitutes its own source IP address and a selected port number, e.g., 211.99.28.10:1037, into packet 40 to create packet 40'. The correspondence between the source IP address and source port number of computer 43, as well as a selected destination port number on gateway computer 41, are recorded in a table or database located on, or accessible to, gateway computer 41. Gateway computer 41 then forwards modified data packet 40' toward the original destination, possibly via additional gateways and routers, not shown in FIG. 4, until packet 40' reaches computer 46.

This is not determination in the gateway of a substitution address for use by at least one other device attached to the local network when communicating with the given device, as set forth in limitation (ii). Instead, the cited portions of Krishnan simply teach to replace a local network device source IP address with the gateway source IP address. The Krishnan arrangements will therefore suffer from problems of the type identified by Applicants at page 1, line 25 to page 2, line 4 of the specification.

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In other words, due to IP addressing disparity associated with remotely-assigned IP addresses on the local network, a communication from a given device on the local network in Krishnan that is directed to another device on the local network will have to be routed from the given device, out through the gateway to the external network, and back in from the external network through the gateway to the other device on the local network. The alteration of source IP addresses as described in Krishnan does not solve this problem, while the present invention as set forth in claim 1 does solve this problem.

Moreover, it should be noted with regard to limitation (ii) of claim 1 that the establishment of the substitution address is based at least in part on the determined remotely-assigned address information. Since the gateway in Krishnan simply replaces all source IP addresses of the local network devices with the gateway source IP address, there is no substitution address in Krishnan that is established based at least in part on the determined remotely-assigned address information as claimed.

It is therefore believed that claim 1 is not anticipated by Krishnan.

Independent claims 11 and 21 are believed allowable for reasons similar to those identified above with regard to independent claim 1.
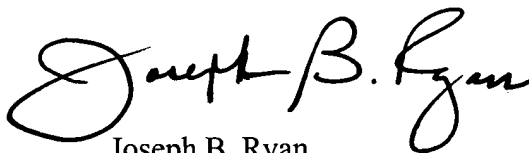
Dependent claims 2-10 and 12-20 are believed allowable for at least the reasons identified above with regard to their respective independent claims.

In addition, U.S. Patent No. 6,414,952 (hereinafter "Foley") fails to remedy the above-described deficiencies of the Krishnan reference as applied to claims 1, 11 and 21. Therefore, the Foley and Krishnan references, even if assumed for purposes of argument to be combinable in the manner urged by the Examiner, fail to teach or suggest all of the limitations of claims 4 and 14 as alleged by the Examiner.

In view of the above, Applicants believe that claims 1-21 as amended are in condition for allowance, and respectfully request withdrawal of the §112, §102(e) and §103(a) rejections.

Attached hereto is a marked-up version of the changes made to the specification and claims by the present amendment.

Respectfully submitted,

Date: February 12, 2003

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IN THE SPECIFICATION

The paragraph beginning on page 2, line 10, has been amended as follows:

In accordance with the invention, a local area network (LAN) or other type of local network is interfaced with one or more external network elements via a gateway that implements an address substitution mechanism for ensuring that communications between devices attached to the local network are not routed through an external network as a result of, e.g., disparity in their remotely-assigned [Internet protocol (IP)] IP addresses. In accordance with the invention, the gateway is configured to intercept communications from devices on the local network in order to determine remotely-assigned IP address information for those devices. After such information is determined for a given device, the gateway creates a set of address substitution information that includes sub-network compatible addresses for use by other devices on the local network when communicating with the given device. The substitution addresses are then used in subsequent communications between the devices on the local network.

The paragraph beginning on page 6, line 13, has been amended as follows:

It should be noted that a given row in the address substitution matrix corresponds to a particular device on the LAN 102, and includes entries for the gateway 110 and for each of the other devices on the LAN 102 that have a corresponding row in the matrix. For example, the row for PC-1 includes entries for gateway 110, and the other two devices that are registered with gateway 110 and have entries in the matrix, i.e., PC-2 and PC-3. Similarly, the row for PC-2 includes entries for gateway 110, and the other two devices that are registered with gateway 110 and have entries in the matrix, i.e., PC-1 and PC-3. A given entry Ci-PCj in the row for the device PC-j designates an address that PC-i should use in communicating with PC-j. For example, PC-1 when communicating with PC-2 should use the address specified by the entry [C1PC2] C1-PC2 in the address substitution matrix of TABLE 1.

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IN THE CLAIMS

1. (Amended) An apparatus for use in interfacing a local network to one or more external network elements, the apparatus comprising:

a gateway coupled between the local network and the one or more external network elements, the gateway being operative to determine remotely-assigned address information for a given device attached to the local network[,]; and to establish, based at least in part on the remotely-assigned address information, a substitution address for use by at least one other device attached to the local network when communicating with the given device.

2. (Amended) The apparatus of claim 1 wherein the remotely-assigned address information comprises an Internet protocol (IP) address assigned to the [at least one] given device by an external network element.

8. (Amended) The apparatus of claim [5] 6 wherein a given one of the sets of address substitution information for a particular one of the plurality of devices comprises a set of IP addresses, each of which is sub-network compatible with an IP address remotely assigned to the corresponding device, such that communications between the given device and another one of the devices attached to the local network are not routed through an external network element.

11. (Amended) A method for use in interfacing a local network to one or more external network elements, the method comprising the steps of:

determining, in a gateway coupled between the local network and the one or more external network elements, remotely-assigned address information for a given device attached to the local network; and

establishing a substitution address for use by at least one other device attached to the local network when communicating with the given device, based at least in part on the remotely-assigned address information.

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12. (Amended) The method of claim 11 wherein the remotely-assigned address information comprises an Internet protocol (IP) address assigned to the [at least one] given device by an external network element.

18. (Amended) The method of claim [15] 16 wherein a given one of the sets of address substitution information for a particular one of the plurality of devices comprises a set of IP addresses, each of which is sub-network compatible with an IP address remotely assigned to the corresponding device, such that communications between the given device and another one of the devices attached to the local network are not routed through an external network element.

21. (Amended) A machine-readable medium storing one or more programs for use in interfacing a local network to one or more external network elements, wherein the one or more programs [which] when executed by a processor implement the steps of:

determining, in a gateway coupled between the local network and the one or more external network elements, remotely-assigned address information for a given device attached to the local network; and

establishing a substitution address for use by at least one other device attached to the local network when communicating with the given device, based at least in part on the remotely-assigned address information.